Instructions

E90 - Process Information and Emissions

General Information: Enter the Plant ID, company name, and emission year. Also enter the Emission Unit Identifier and Emission Process/Point Identifier from the E10T Form.

Comments: Enter any relevant comments about this emission process/point for this emission year. (optional)

Throughput

Actual hours of operation in the year: Enter the actual number of hours this emission process/point operated in the emission year.

Throughput per hour: This is the number of pounds per hour or other unit per hour of raw material used or moved or product produced. Whether to use raw material or product depends on which is more appropriate for calculating emissions for this emission process/point based on available emission factors or engineering calculations.

Throughput per year: This is the number of pounds or other unit of raw material used or moved or of product produced in one calendar year of typical operation.

Control Devices and Other Control Measures

Each control device or control measure should be described in Form E92T. On this form (E90), use those control device identifiers (e.g. C1) to indicate what percentage of the emissions from this emission process/point is captured by the control device (the capture efficiency of the control device ("% Captured")).

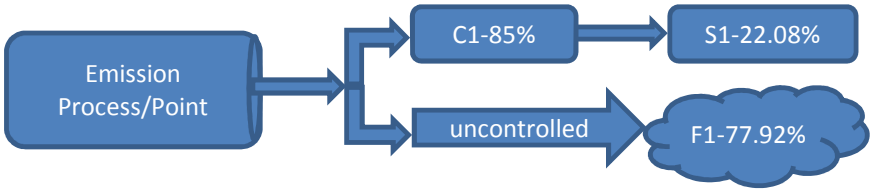
Capture efficiency: List the capture efficiency for each emission stream. Include fugitive release points. **Capture efficiency is NOT the same as Control efficiency.** Any emissions not captured by the control device are Fugitive and should be allocated to the Fugitive Release Point as described in Form E91T.

Sequence: List whether the control devices are in **series or parallel**. For a singular control device, enter "NA." The percent allocations should add to 100% for all control devices in "parallel." The percent allocations may be greater than 100% for all control devices in "series."

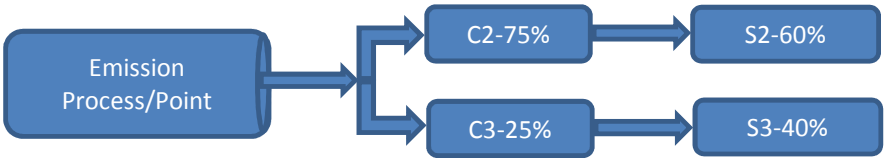
% Uptime (Control Effectiveness): Enter the percent of the time this control measure was functioning (as a percent of the time the plant was in operation) for the emission year.

Examples:

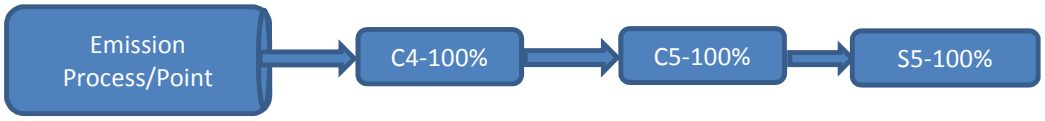
Example 1: Suppose you have a control device identified as "C1" and and 85% percent of the emissions are captured by the control device venting to Stack "S1", but 15% leak out (fugitive) to "F1". In this case, you would enter "C1" under "Control Device Identifier", and "85" under "% Captured" in the first row. For the sequence, you would enter "NA" in the first row.



Example 2: Suppose you have two control devices identified as "C2" and "C3", as shown in the diagram below. For this example, assume 75% percent of the emissions go through C2, and the remaining 25% are all captured by C3 with no leaks. In this case, you would enter "C2" under "Control Device Identifier", and "75" under "% Captured" in the first row, then "C3", and "25" under "% Captured" in the second row. For the sequence (in both rows), you would enter "parallel".



Example 3: Suppose you have two control devices identified as "C4" and "C5", as shown in the diagram below. For this example, assume 100% percent of the emissions go through C4, followed by C5, with no leaks. In this case, you would enter "C4" under "Control Device Identifier", "100" under "% Captured", and "series" under "Sequence" in the first row, then "C5", "100" and "series" in the second row.



Stacks and Other Release Points

Each stack, chimney, vent and each of fugitive emissions (leaks) should be described in Form E91T. On this form (E90), use those release point identifiers to indicate what percentage of the emissions from this emission process/point goes to which release points, regardless of whether the emissions pass through a control device or not. The total of the % of Emissions of all the rows must equal 100%. For controlled processes, the stack allocations may be different for each pollutant. In those cases, please use the control efficiency for the criteria pollutant with the highest emissions.

The Release Point allocation (RP_{S1}) can be determined by the following formula (up to *n* release points):

$$RP_{S1}=\frac{Emissions\ releaseed\ from\ Stack\ S1}{Total\ process\ emissions}$$

OR

$$RP_{S1}=\frac{(Capture_{C1/F1})\times\ (1-Efficiency_{C1})}{[(Capture_{C1/F1})\times\ (1-Efficiency_{C1})]+[(Capture_{C2/F2})\times\ (1-Efficiency_{C2})]+\cdots+[(Capture_{Cn/Fn})\times\ (1-Efficiency_{Cn})]}$$

where: $Capture_{C1}$ = % captured of Control Device 1 or any fugitive release point

$Efficiency_{C1}$ = Control efficiency (%) of Control Device 1

(For fugitive release points, this number is "0".)

n = number of control devices and fugitive releases

Examples:

Example 1: Suppose you have a stack identified as "S1" (from a control device) and a fugitive emissions area identified as "F1." Also suppose that 85% percent of the emissions are captured by the control device, but 15% leak out through the fugitive emissions area. The control device has a 95% control efficiency. (See Example 1 above.) Use the following formula to calculate the percent allocation. In this case, you would enter "S1" under "Release Point Identifier" and "22.08" under "% of Emissions" in the first row. In the second row, you would enter "F1" and "77.92".

$$RP_{S1}=\frac{(0.85)\times\ (1-0.95)}{[(0.85)\times\ (1-0.95)]+[(0.15)\times\ (1-0.0)]}=\frac{0.0425}{0.0425+0.15}=22.08\%$$

Example 2: Suppose 75% of the emissions from the process go through stack "S2" (from a control device) and the other 25% go through stack "S3" (from a control device) with no leaks. The control devices have control efficiencies of 95% and 90%, respectively. (See Example 2 above.) In this case, you would enter "S2" under "Release Point Identifier" and "60" under "% of Emissions" in the first row and "S3" and "40" in the second row.

$$RP_{S2}=\frac{(0.75)\times\ (1-0.95)}{[(0.75)\times\ (1-0.95)]+[(0.25)\times\ (1-0.90)]}=\frac{0.0375}{0.0375+0.025}=60\%$$

Emissions

Enter the actual emissions for each pollutant emitted from this emission process/point.
Attach all spreadsheets used to calculate emissions.
Calculation Method: Choose the method used to determine the reported emission values. If more than one method was used for the same pollutant for this emission process/point, use the second item in the list, Engineering Judgement.
Emission Factor: If you selected an emission factor in the "Calculation Method" column, enter a "value" and "units" in the appropriate column. For the units, the numerator should be in pounds and the denominator should be in terms of the SCC (Source Classification Code) you entered on the E10T Form.

Examples:

Example 1: For CO emissions from natural gas combustion in a 90 MMBtu/hr boiler, you could enter "84" and "lb/mmscf."

Example 2: For PM-10 filterable emissions from a transfer operation with a site specific emission factor, you could enter "0.01" and "lb/ton."

For a fuel combustion process, use form E20 and your own calculations to determine the General and Hazardous Air Pollutants emitted.

For a process other than fuel combustion, use the data in forms E40, E44, E45, E50, E54 and/or E55 as appropriate to determine the General and Hazardous Air Pollutants emitted.

1. General Air Pollutants:

Enter emissions in tons.

Particulate matter is broken up into PM-condensable, $PM_{2.5}$-filterable (filterable particulate matter smaller than 2.5 microns) and PM_{10}-filterable (filterable particulate matter smaller than 10 microns), to fulfill US EPA reporting requirements.

TSP = PM-filterable + PM-condensable.
Total PM_{10} = PM_{10}-filterable + PM-condensable.
Total $PM_{2.5}$ = $PM_{2.5}$-filterable + PM-condensable.

VOC emissions should also include emissions from Hazardous Air Pollutants, as applicable. Title V and FEDOOP sources will **not** be double-billed for HAPs that are VOCs and PM.

2. Hazardous Air Pollutants (HAPs) and Toxic Air Contaminants (TACs):

In each row, select a HAP from the drop-down list. **Enter the HAP and TAC emissions in pounds.** ***Metal compound HAPs should be reported as single aggregate pollutants, if this information is known. For example, cobalt compounds should be reported as the cobalt base metal, if known.*** If there are more than 20 HAPs, use a second copy of the form or an attached sheet. (On the second copy, only the plant ID, emissions year, emission process/point ID and the additional HAPs and amounts need to be filled in.)

If no HAPs are emitted from this emission process/point then mark the box at the bottom of the table.
The **"Page Identifier"** box at the bottom of the form is provided as a place where you can enter your own identifier for each copy of this form among the other pages in your emissions inventory submittal.

Louisville Metro Air Pollution Control District

Form E90 - Process Information

Please read the instructions carefully before completing this form to quantify the emissions for each emission process/point.

Plant ID: | Emission Year:

Company Name:

Emission Unit ID:

Emission Process/Point:

Comments:

Throughput

Operating Schedule for the Emission Year:

Actual hours this emission process/point operated in the report year:

			Units
Throughput:	Throughput per hour:		Select Units
	Throughput per year:		Select Units

Control Devices and Stacks:

Use the control device identifiers from Form E92T to allocate emissions to control devices. List the capture efficiency for each emission stream. **Sequence:** Include whether the device operates in parallel or series. Enter "NA" for a singular control device.

Control Device Identifier	% Captured	Sequence	% Uptime

Stacks and Other Release Points:

Use the release point identifiers from Form E91T to allocate emissions to release points.

Release Point Identifier	% of Emissions
Total (must equal 100%):	0%

Page Identifier:

Emissions

Emission Process/Point:

1. General Air Pollutants:

Enter the actual emissions in **tons** for each pollutant emitted from this emission process/point.

Attach all spreadsheets used to calculate emissions.

Pollutant	Tons	Calculation Method	Emission Factor Value	Emission Factor Units
Volatile organic compounds (including HAP VOCs)				
Carbon monoxide (CO)				
Oxides of nitrogen (NOx)				
Sulfur dioxide (SO_2)				
Particulate matter: TSP (filterable + condensable)				
PM_{10}-filterable (particulate matter <10 µm)				
$PM_{2.5}$-filterable (particulate matter <2.5 µm)				
PM-condensable (condensable particulate matter)				
Ammonia (NH_3)				
Boron trifluoride, CAS # 7637-07-2				
Nitric acid, CAS # 7697-37-2				
Sulfuric acid, CAS # 7664-93-9				

2. Hazardous Air Pollutants (HAPs) and Toxic Air Contaminants (TACs):

In each row, select a HAP from the drop-down list and enter the emissions for the year in **pounds**. If there are more than 20, use a second copy of the form or an attached sheet. **Attach all calculations.**

	Pollutant	Pounds	Calculation Method	Emission Factor Value	Emission Factor Units
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					

Total HAPs: 0.00 lb

= 0.00 tons

☐ There are no HAPs emitted from this emission process/point.

Page Identifier:

Emissions Calculation Methods

Description
CEMS
Engineering Judgment
Material Balance
Stack Test (uncontrolled)
USEPA Speciation Profile
APCD or KY Speciation Profile
Manufacturer Specification
US EPA EF (uncontrolled)
APCD or KY EF (uncontrolled)
Site-Specific EF (uncontrolled)
Vendor EF (uncontrolled)
Trade Group EF (uncontrolled)
Other EF (uncontrolled)
Stack Test (controlled)
USEPA EF (controlled)
APCD or KY EF (controlled)
Site-Specific EF (controlled)
Vendor EF (controlled)
Trade Group EF (controlled)
Other EF (controlled)

Throughput Unit of Measurement
Select Units
ACRES
ACRE-DAYS
ACRE-MONTHS
ACRE-YEARS
AMPERE-HOURS
BALES
BARRELS
BARRELS (50 GALLON)
BOARD FEET
BUSHELS
DAY
100 BARRELS
100 POUNDS
100 TONS
1000 AMPERE-HOURS
1000 BARRELS
1000 BARRELS (31 GALLON)
1000 BOARD FEET
1000 BUSHELS
1000 EACH
1000 FEET
1000 SQUARE FEET
1000 CUBIC FEET
1000 STANDARD CUBIC FEET
1000 GALLONS
1000 HORSEPOWER-HOURS
1000 POUNDS
1000 MILES
1000 TONS
1000 CUBIC YARDS
10,000 SQUARE FEET
100,000 HORSEPOWER-HOURS
MILLION BOARD FEET
MILLION BTUS
MILLION EACH
MILLION SQUARE FEET
MILLION CUBIC FEET
MILLION STANDARD CUBIC FEET
MILLION GALLONS
MILLION POUNDS
MILLION MILES
MILLION TONS
EACH
FEET
SQUARE FEET
CUBIC FEET
STANDARD CUBIC FEET
SCFM-YEAR
DRY STANDARD CUBIC FEET
GALLONS
GALLON PER MINUTE-YEAR
HORSEPOWER-HOURS
HOUR
KILOGRAMS
KILOWATT-HOUR
POUNDS
CUBIC METERS
MEGAGRAMS
MILES
MEGAWATT-HOUR
TONS
SQUARE YARDS
CUBIC YARDS
CUBIC YARD-MILES